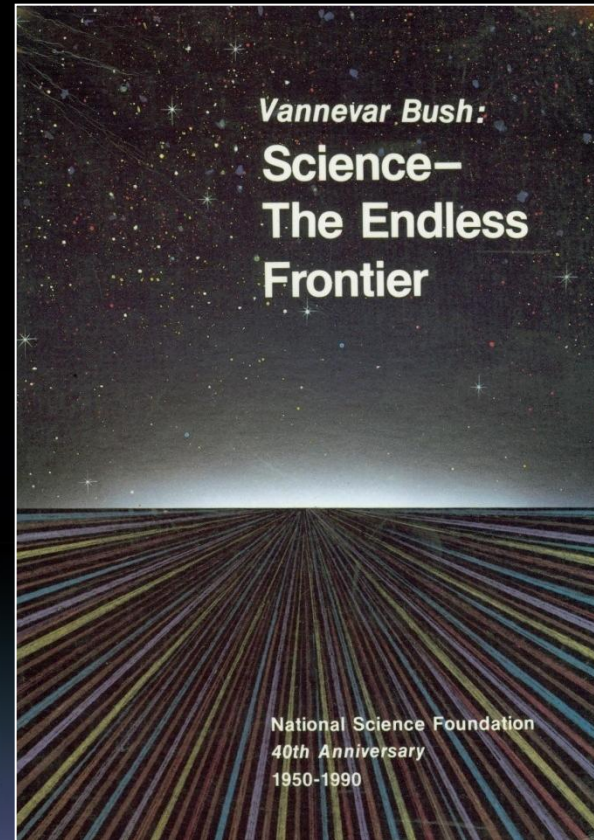


# Science, Technology & Innovation: Recent Initiatives of NSF

Dr. Subra Suresh  
Director  
National Science Foundation

June 5, 2012  
Japan National Institute of Science & Technology Policy  
Tokyo, Japan

# Universities: Catalysts for Innovation



and the creation of the National Science Foundation



# Proposed FY 2013 NSF Budget

## The Big Picture

### NSF FY 2013 Budget

**TOTAL:** \$7.373 billion

**Increase:** \$340 million

**4.8% over FY 2012 enacted**



# NSF Is at “Ground Zero” of U.S. Science Enterprise



NSF sponsors fundamental research across all S&E disciplines and research on STEM education

< 6% overhead; NSF performs no internal research

Annually supports  $\approx$  285,000 individuals at 1,800 institutions

> 46,500 Graduate Research Fellows (GRFs) supported by NSF since 1952. Approx. 40,000 RAs per year.

- 197 Nobel Prize laureates supported by NSF since NSF's inception (1950)
- About 510 Nobel Prizes awarded since 1951 (NSF supported 40% of those)
- 30 NSF GRFs are Nobel laureates
- 440 GRFs are members of the National Academy of Sciences

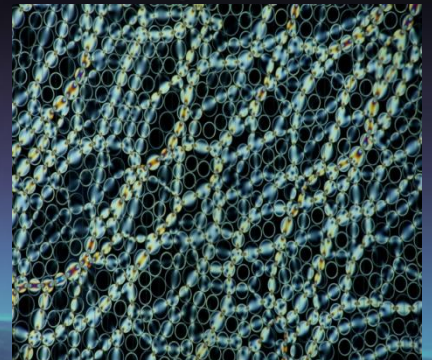
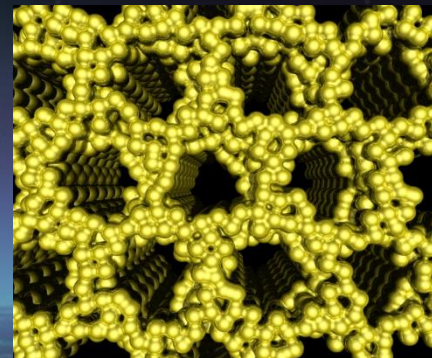
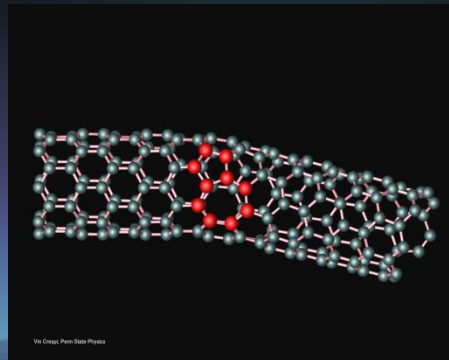
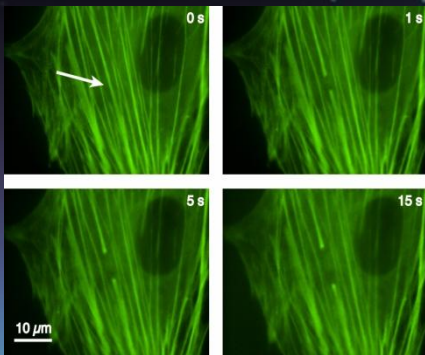
Economic and societal impact



# The U.S. Innovation Ecosystem



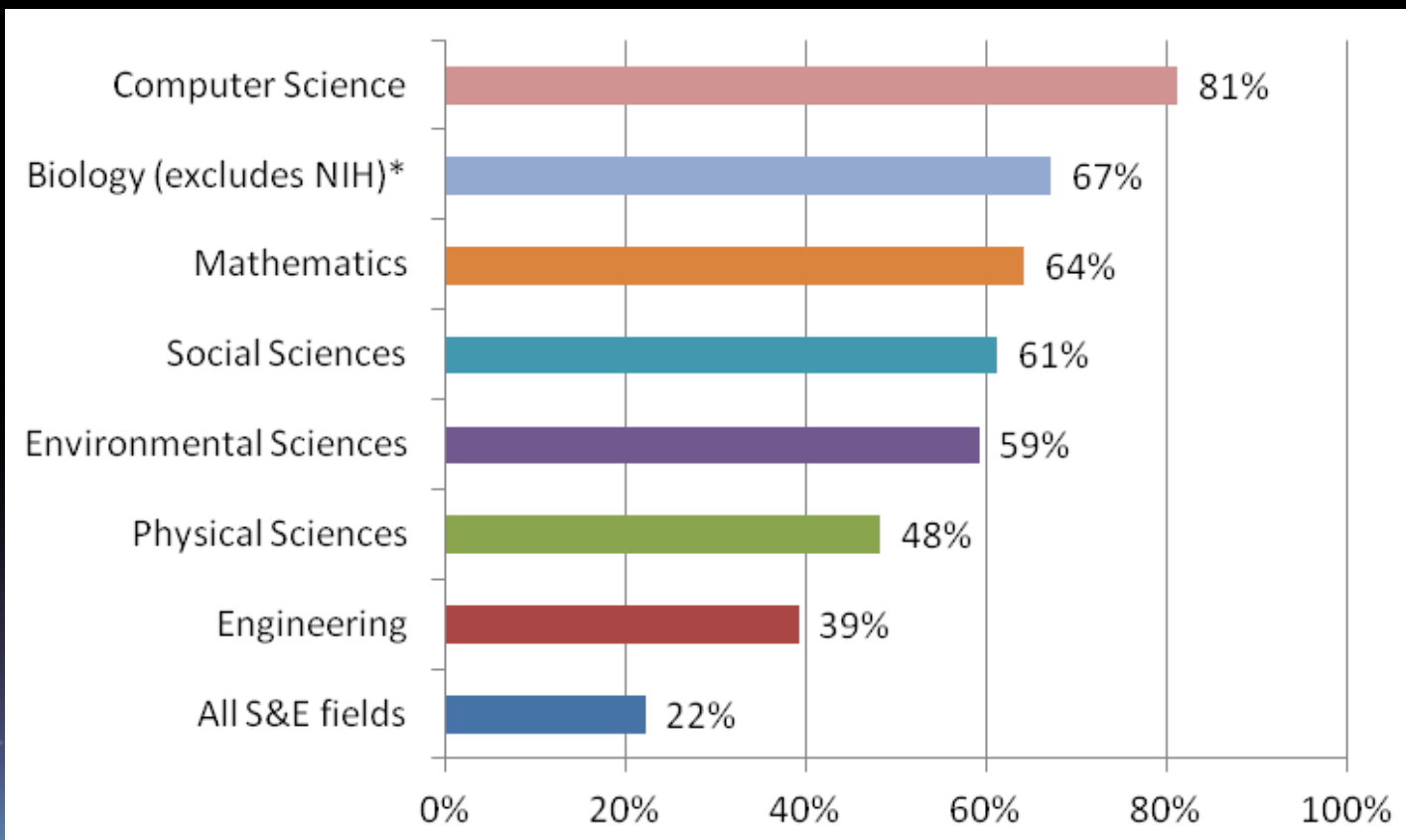
- U.S. has been a global innovation engine >50 years
- U.S. is magnet for talent from around the globe
- U.S. universities are at/near the top of global rankings
- U.S. has well-developed system of higher education with public and private support models
- U.S. has well-established infrastructure with institutions to identify, support, & nurture research, scientific ethics, & integrity
- U.S. has unique models for university-industry-national lab interactions



# NSF by the Numbers



NSF Support of Academic Basic Research  
In Selected Fields  
(as a percentage of total federal support in 2008)

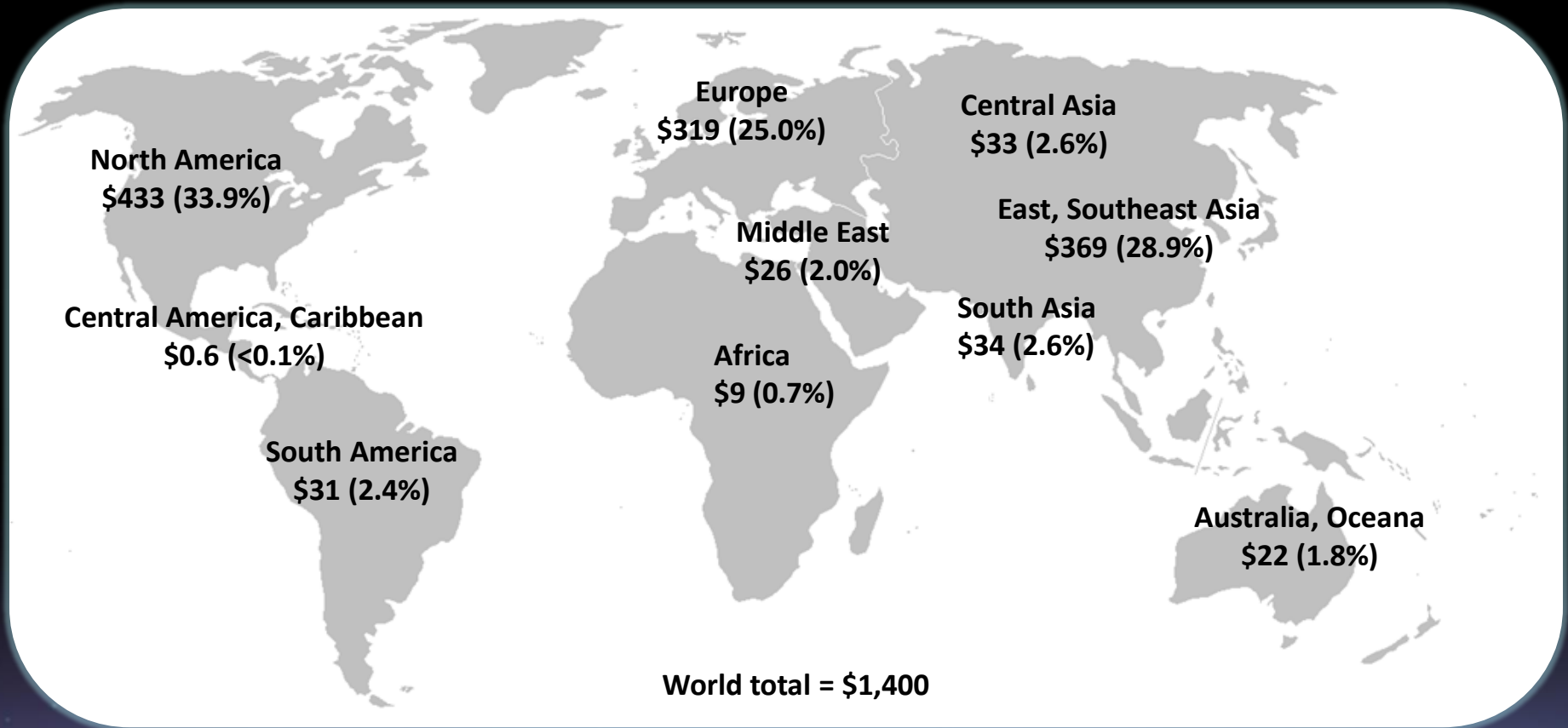


Source: NSF Survey of Federal Funds for Research and Development

# Global R&D Expenditures and Share of World Total by Region



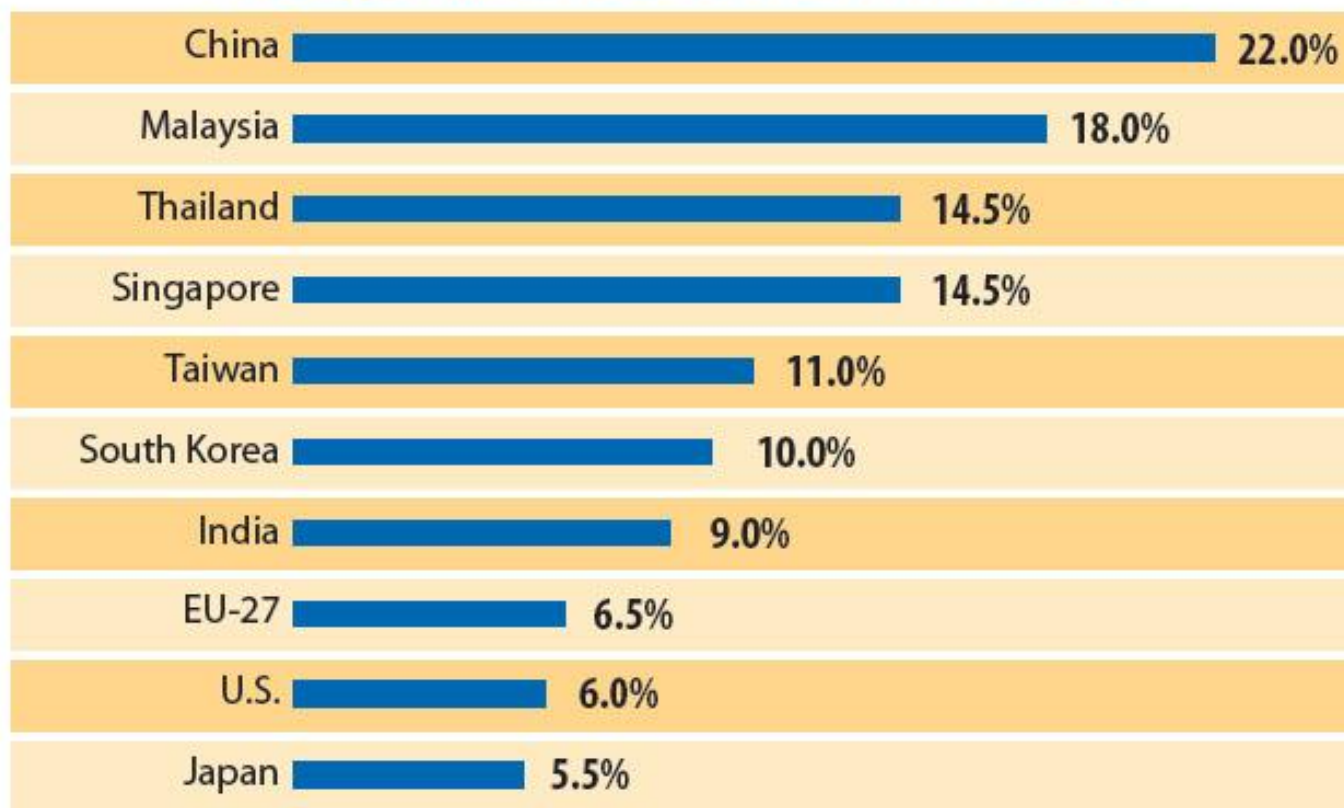
(Billions of 2009 U.S. Purchasing-Power-Parity Dollars)





# R&D Rates of Growth

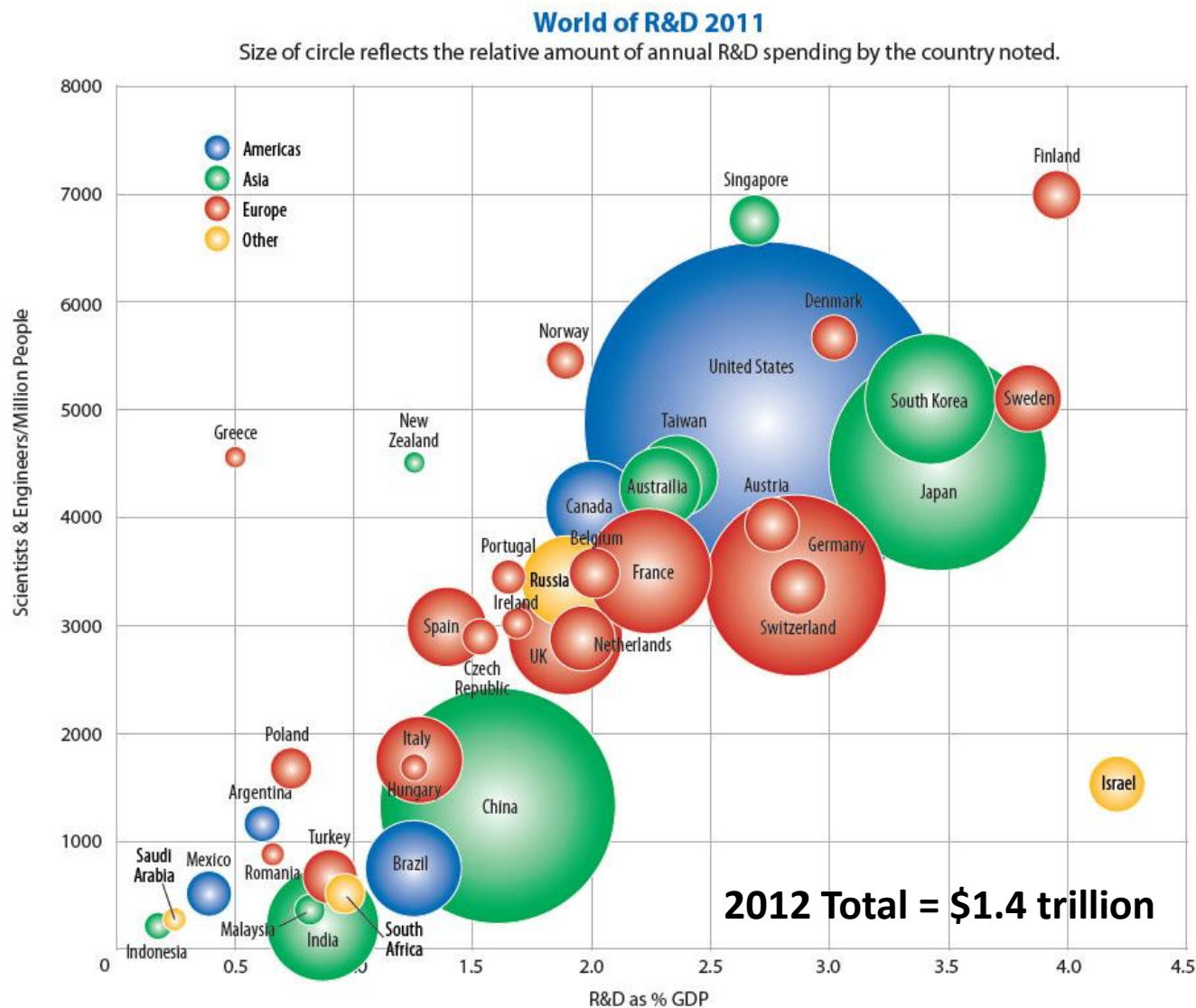
## Average Annual R&D Growth, 1996 to 2007



Source: Battelle, *R&D Magazine*

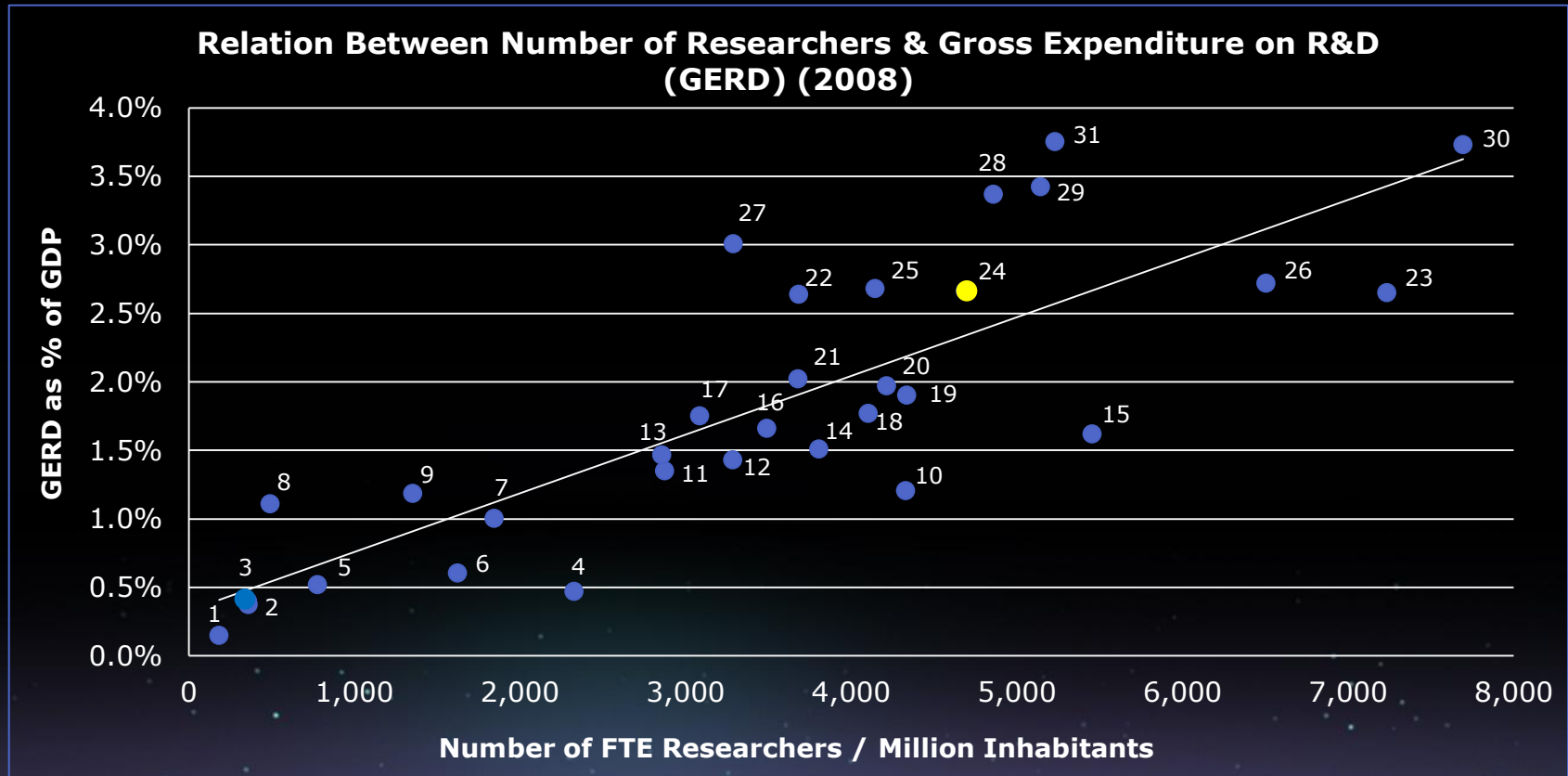


# World R&D 2011



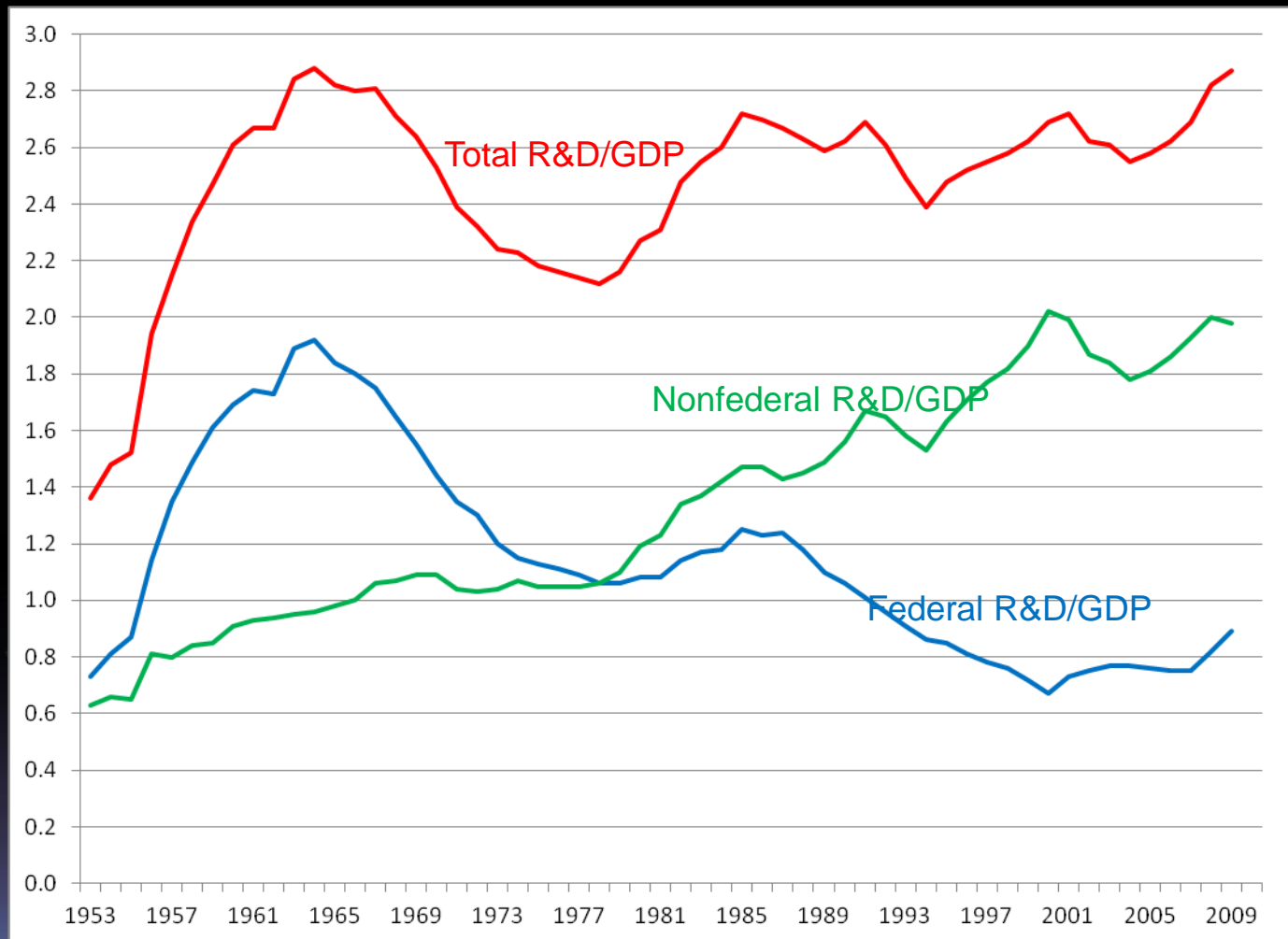
Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA World Factbook, OECD

# R&D Investment vs Scientific Potential



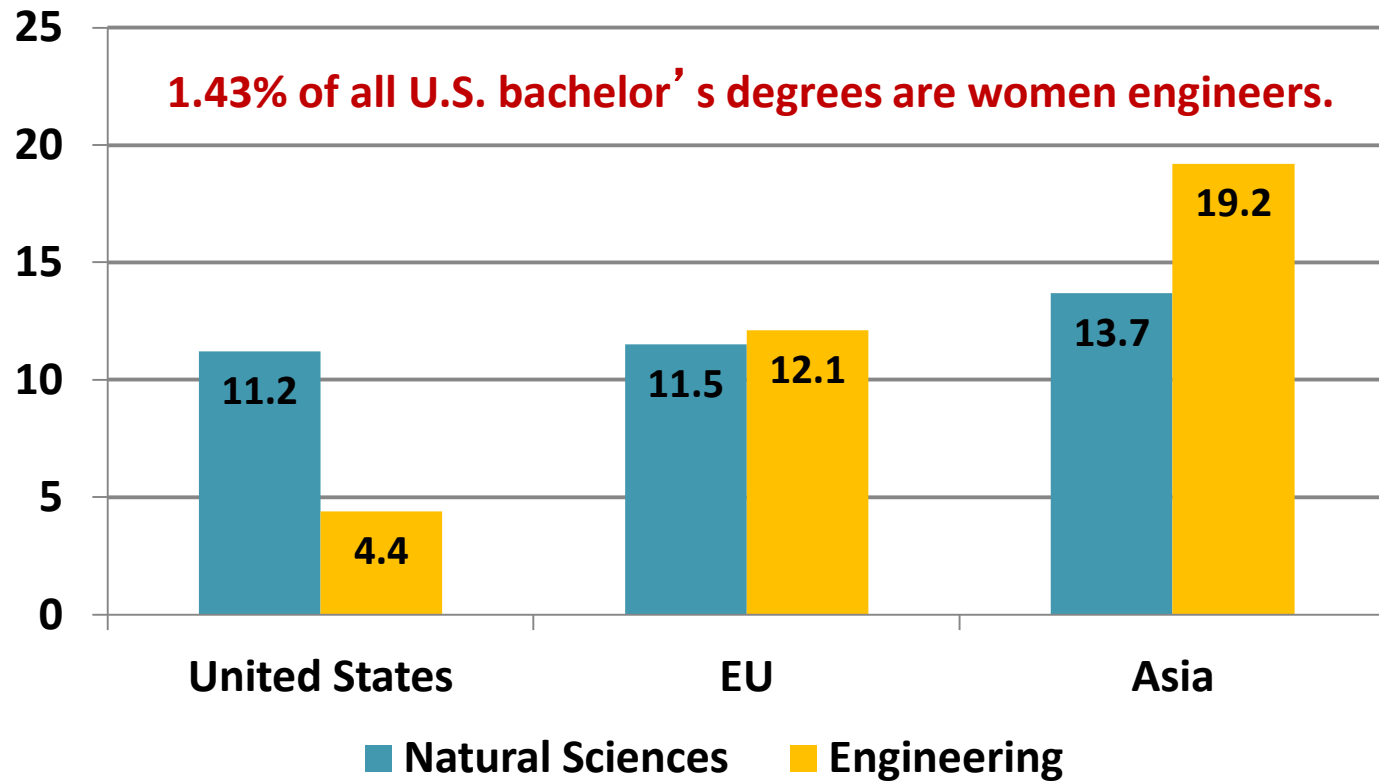
1 Colombia	6 Poland	11 Spain	16 Slovenia	21 France	26 Denmark
2 Mexico (07)	7 Hungary	12 Ireland	17 Netherlands	22 Germany	27 Switzerland
3 Chile	8 Brazil	13 Czech Republic	18 United Kingdom	23 Iceland	28 Korea
4 Slovak Republic	9 Italy	14 Portugal	19 Canada (07)	24 United States (07)	29 Japan
5 Argentina	10 New Zealand	15 Norway	20 Australia (06)	25 Austria	30 Finland
					31 Sweden

# Ratio of U.S. R&D to GDP; Roles of Federal & Nonfederal Funding: 1953-2009



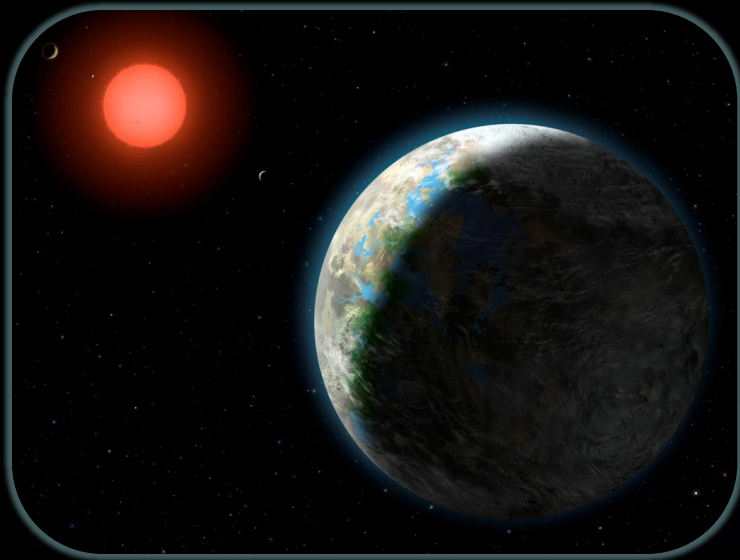
Source: Adapted from NSF, National Center for Science and Engineering Statistics, National Patterns of R&D Resources, *InfoBrief*, NSF 12-310, March 2012.

# Percentage of Undergraduate Degrees in the Natural Sciences and Engineering (2008)





# New Era of Science

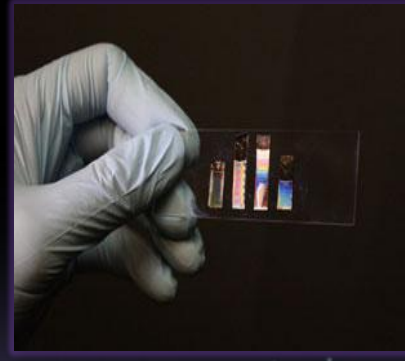
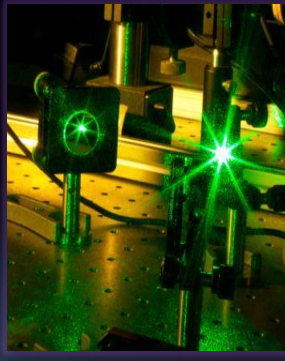
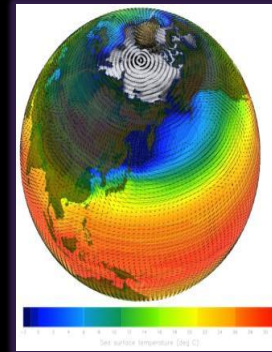
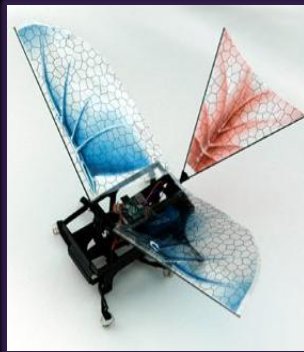


Era of Observation  
(Theory, experiment,  
computation, “citizen science”)



Era of Data and  
Information

# Fundamental Science and Engineering Research and Education



**Investing in NSF core programs**

**Principled commitment to support GRFs, postdocs, and CAREER awards and to broaden participation**

# Tackling National & Global Challenges

- Science, Engineering & Education for Sustainability (SEES)
- Cyber Infrastructure Framework for 21<sup>st</sup> Century (CIF21)
- National Robotics Initiative
- National Nanotechnology Initiative
- Biomaps
- Advanced Manufacturing Initiative
- Secure Smart Systems and Cyber Security
- Materials Genome Project
- Computational & Data-enabled Science & Engineering
- Real-time Networks and Major Research Facilities

# World-class Facilities & Instruments





# World-class Facilities & Instruments



# World-class Facilities & Instruments

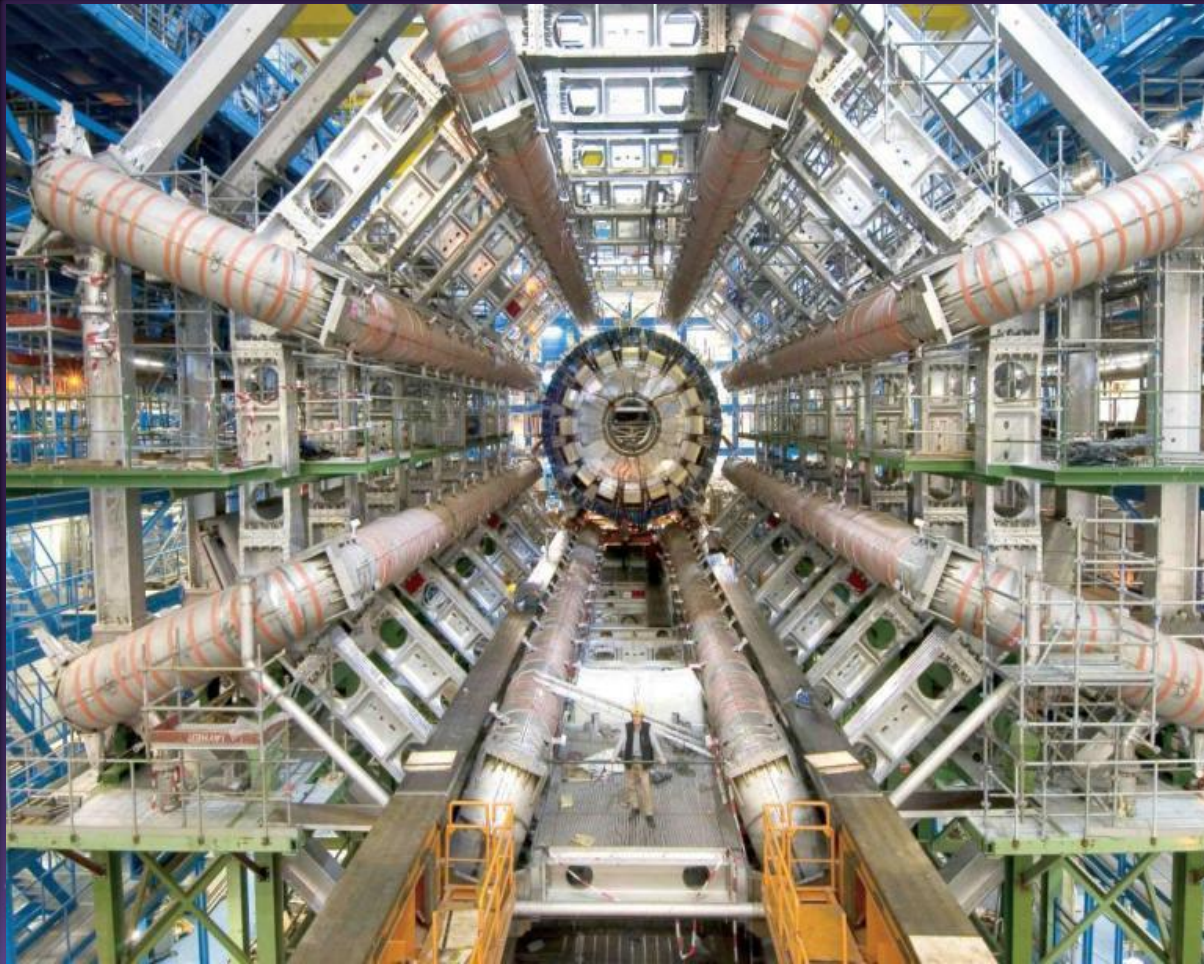


# World-class Facilities & Instruments





# World-class Facilities & Instruments





May 2012  
Washington, DC

Next meeting.....

Co-hosted by Brazil and Germany  
Berlin, 28-29 May, 2013

Good science anywhere is good for science everywhere  
provided that .....

# PEER: Partnerships for Enhanced Engagement in Research



Launched July 7, 2011



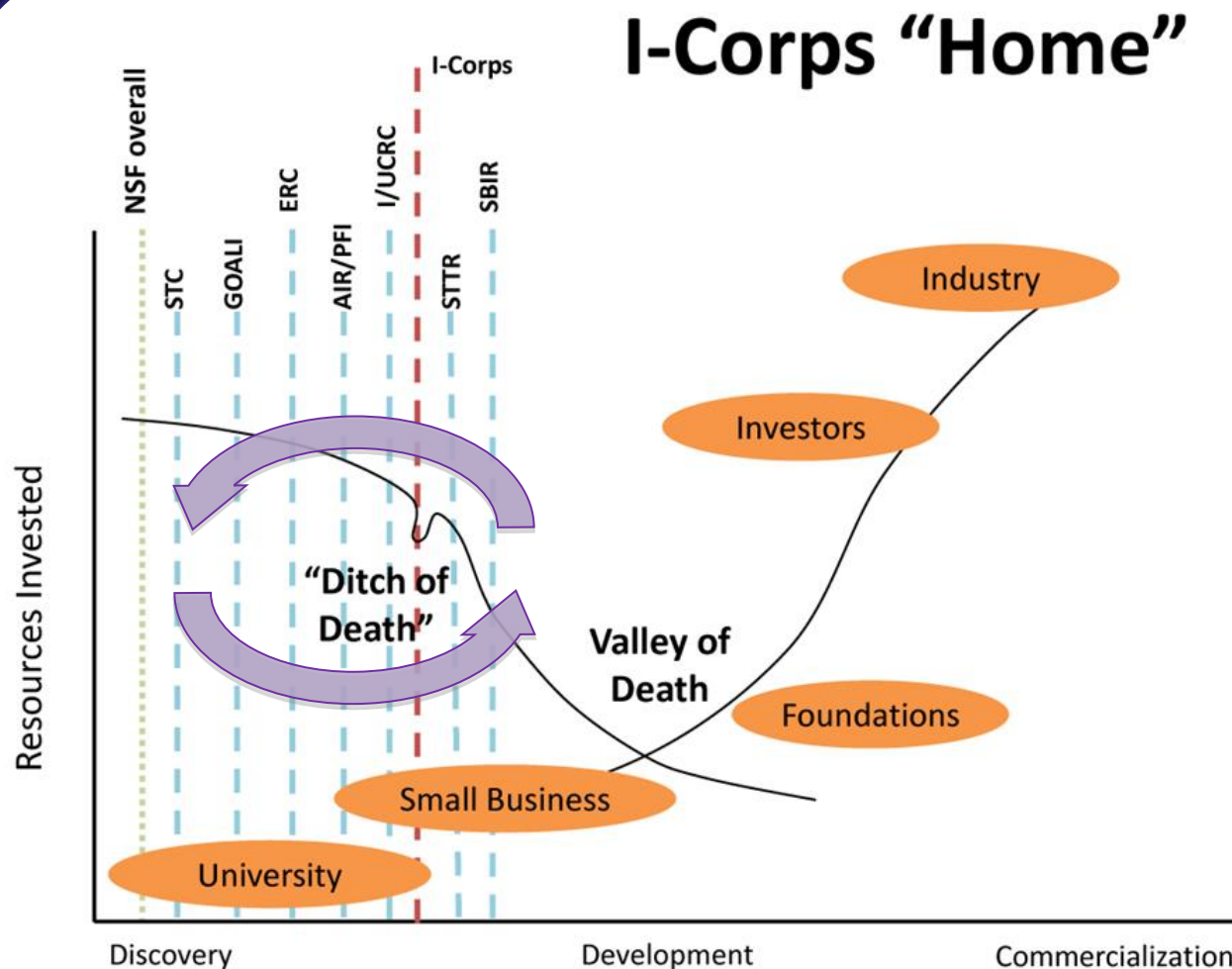
# Innovation Corps (I-Corps)

Launched July 29, 2011



Accelerating innovation from the laboratory to  
the marketplace

# The Ditch of Death





# SAVI: Science Across Virtual Institutes



Launched October 5, 2011

# Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)



First Awards in FY 2012



Creating a culture of collaboration, innovation,  
risk-taking, and experimentation



# NSF Career-Life Balance Initiative

Launched September 26, 2011



One NSF

The letters 'One NSF' are rendered in a large, bold, sans-serif font. Each letter is filled with a collage of various images representing different fields of science and technology. The 'O' shows a red research ship on the water. The 'N' features a green circuit board, a satellite dish, and a green plant. The 'S' includes a yellow and blue satellite, a white satellite dish, and a green plant. The 'F' shows a colorful abstract pattern, a building, and two children working together. The background is a deep space scene with a starry sky and a view of the Earth's horizon at the bottom.

One NSF

